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Relationship between Training and Development of Employees and Productivity Improvement, an Empirical Study in RMG Sector of Bangladesh

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Abstract: *Ready Made Garments (RMG) industry is an important business sector of Bangladesh. It is contributing a great share on employment generation and economic development of the country. Although the volume of export increases the recent years, the profit margin of the individual organisation is declining. One of the reasons behind the scenario may be the decreased productivity. In the other words non-optimal apply of different resources. Productivity improvement of any firm is the key to sustain economic growth. Productivity can be improved in many ways such as, developing human resources (through training and development), enhancing physical resources (through technology adoption), and improving production processes (through technology management). Being interested in the development of human resource in RMG sector, we carried out this research. The theme of the research was to verify the relationship between productivity improvement and the training and development of employees. In this regard an exploratory study involving thirty factories of RMG sector has been performed. The study includes structured interviews with developed questionnaire, direct observation, informal interviews and verifying archival data. In our study, we classify training and development program into four levels of employee. We find in our study that, the factories those are providing training enjoying increased productivity other than those are not providing training.*

Keywords: *Labour Productivity, Productivity Improvement, SPSS, Training and Development.*

I INTRODUCTION

The significance of productivity in increasing national welfare is now universally recognized. There is no human activity that does not benefit from the improve productivity. This is important because more of the increase in gross national income or GDP (Gross National Product) is produced by improving the effectiveness and quality of manpower than by using additional labour and capital. In other words, national income or GDP grows faster than the input factors when productivity is improved.

Productivity improvement, therefore, results in direct increase in the standard of living under conditions of distribution of productivity gains according to contribution. At present, it would not be wrong to state that productivity is the only important world-wide source of real economic growth, social progress and improved standard of living.

RMG sector is one of the prominent sectors in Bangladesh. About 78.97% of the foreign earning is coming through this sector. [2] RMG sector contributes 13% to GDP of Bangladesh adding 38% of value to the industrial sector. Around 4.5 million workers are employed in the textiles and clothing industry of which 80% are women. Many backward and forward linkages like bank, insurance, shipping, packing organizations are developed based on this sector. So, there is a great opportunity to increase gross national income or GDP in Bangladesh by improving productivity in RMG sector.

II BACKGROUND OF STUDY

RMG sector in Bangladesh has come a long way in last two decades. The industry has crossed many hurdles to stay competitive. It has proved many predictions futile and wrong, and competes fiercely even after the abolition of quota. The credit for that achievement goes to both the entrepreneurs and the labourers. But the question is how long they can survive?

Apparel makers expressed their concern that the flow of orders from international buyers may decline as the competing countries have taken different aggressive marketing measures. On the other hand, the cost of doing business increased in Bangladesh for different reasons, including price hike of raw materials and higher bank interest rate, said Shafiul Islam Mohiuddin, president of Bangladesh Garment Manufacturers and Exporters Association. The BGMEA chief added that apparel exports increased by more than 42 percent in the July-April period of fiscal year 2010-11 where the profit margin from it declined by 35 percent to 50 percent.

World-class manufacturers view technology is a strategic tool for achieving world-class competitiveness by all elements of the manufacturing organization. High priority is placed in the discovery, development and timely implementation of the most relevant technology and the identification and the support of people who can communicate and implement the results of research. But most of the RMG factories of Bangladesh lack R&D cell and work study department that would conduct conventional practices rather than innovative idea. As a result profit margin is declined. It is our conviction that modern technology and scientific tools must be acquired and practiced to improve and maintain higher productivity level. Work study or industrial engineering department can help monitor and improve productivity related issue. A manufacturer can make the best use of technology only after acquiring proper training to use and adopt that technology. Only then can technology become a powerful force in achieving a competitive advantage.

III PRODUCTIVITY IMPROVEMENT FACTOR

Productivity improvement is not just doing things better: more importantly, it is doing the right things better. This chapter aims to identify the major factors, or "right things", which should be the main concerns of productivity programme managers. Before discussing what to tackle in a productivity improvement programme, it is necessary to review the factors affecting productivity.

The production process is a complex, adaptive, on-going social system. The inter-relationships between labour, capital and the socio-organizational environment are important in the way they are balanced and co-ordinated into an integrated whole. Productivity improvement depends upon how successfully we identify and use the main factors of the socio-production system. It is important, in connection with this, to distinguish three main productivity factor groups:

- Job-related;
- Resource-related;
- Environment-related.

Since our main concern here is the economic analysis of managerial factors rather than productivity factors as such, we suggest a classification which will help managers distinguish those factors which they can control. In this way, the number of factors to be analyzed and influenced decreases dramatically. The classification suggested here is based on a paper by Mukherjee and Singh.

There are two major categories of productivity factor:
- External (not controllable).
- Internal (controllable).

The external factors are those which are beyond the control of the individual enterprise and the internal factors are those within its control.
To deal with all these factors we require different institutions, people, techniques and methods. For example, any performance improvement drive which plans to deal with external factors affecting the management of the enterprise must take such factors into consideration during the planning phase of the programme, and try to influence them by joining forces with other interested parties.

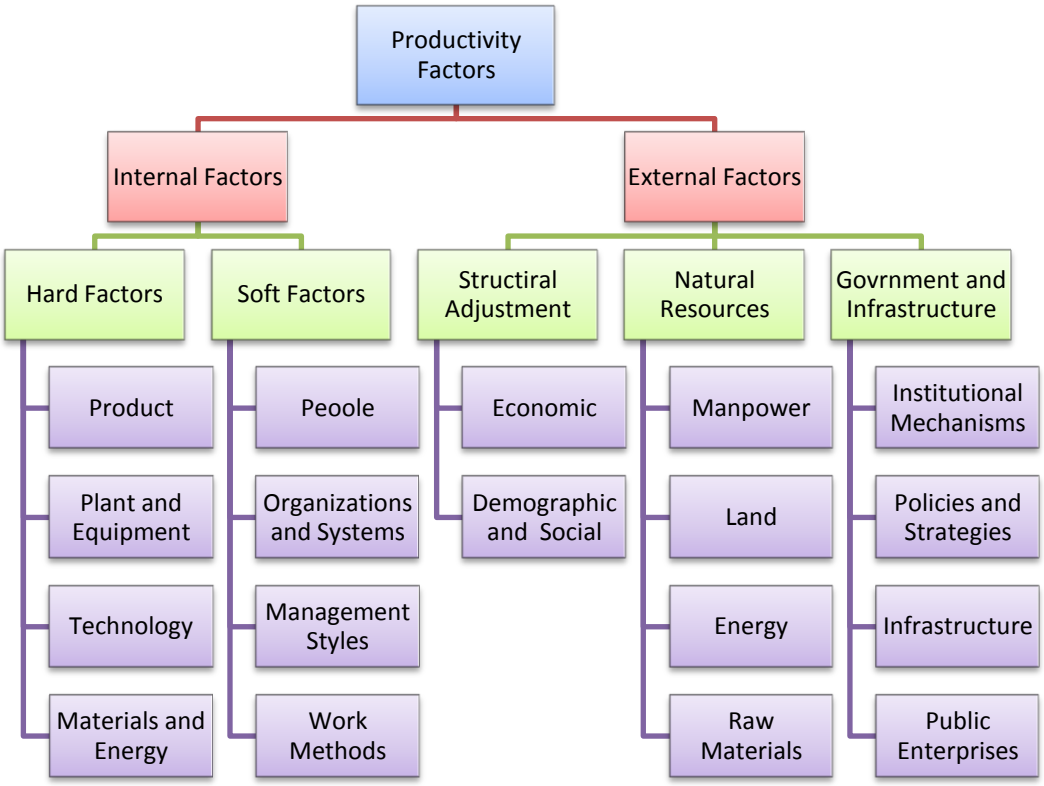

Figure 1: An integrated model of enterprise productivity factors

IV TRAINING FOR IMPROVING PRODUCTIVITY

Only after adequate education, training and development do people become a valuable resource and the most important productivity factor. Therefore, the effectiveness of productivity programs depends on the quality of the workforce and of managers, and their willingness to contribute to improving productivity. There are some key points to be taken into consideration during the design stage of productivity improvement programs. These important questions should be considered in this connection:

- Which people to develop: worker, technicians, managers;
- What form of development: education and training;
- What to teach: productivity awareness, understanding and skills.

From these a three-dimensional matrix can be built (see figure 2), which will help to analyze needs and plan systematic developmental activities for all participant for the productivity program.

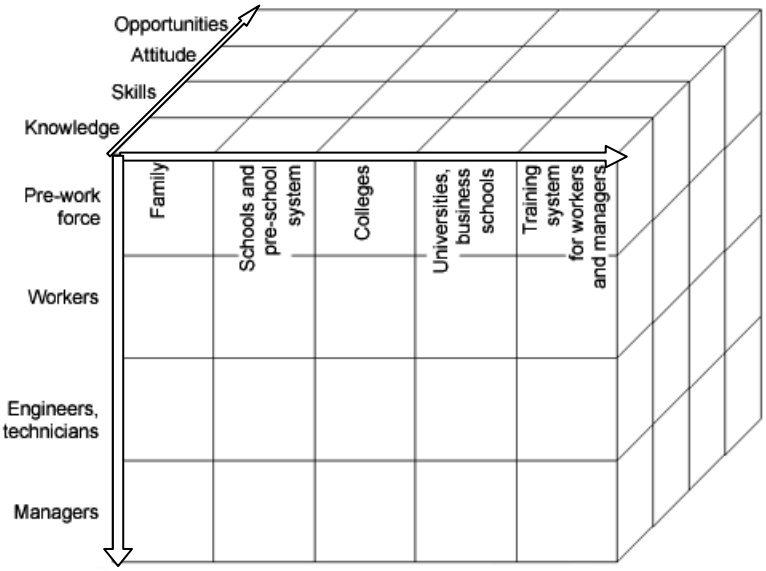

Figure 2: Three-dimensional human resource development matrix

If workers are illiterate, it is difficult for them to contribute to productivity and their ability to participate will increase only with increasing education. Worker must understand the goals and the performance measures.

One of the best approaches is to start exposing workers and supervisors as early as possible to concept such as labour cost, price determination, the links between productivity and socio-economic problems, quality control and work methods. Such training motivates them towards developing innovations in relation to procedures, work methods and work design.

The same applies to managers. They are the first who have to be trained in productivity improvement programs and in related managerial skills and awareness.

With the increasing education of the labour force and with changes in its composition, there will be greater demand for more dynamic and educated trade union leadership. If union leadership lacks competence and does not have the confidence of the members, this will seriously affect productivity improvement programs.

V METHOD

A questionnaire based case study has been performed in thirty different knitwear export oriented Ready Made Garment factories located in Dhaka, Savar, Tongi, Narayangonj and Gazipur at various times in 2011.The focal point of the research work was to develop a relationship between training and productivity improvement in Ready Made Garments industries. Here we analyses the definition of productivity, necessity for productivity improvement, needs for training to improve productivity and present training facilities in RMG sector in Bangladesh. In this study we work with partial productivity that is labour productivity. Labour productivity is the ratio of total output and total number of employee.

$$labour\ productivity = \frac{total\ \ output}{total\ \ number\ \ of\ \ employee} \quad (1)$$

The study flow following steps:

- **Conducting a primary survey**
- **Preparing the primary questionnaire**
- **Modification of the questionnaire:** Modifications were carried out considering the specific subject area through addition, deletion, as well as reformation. After that the final questionnaire was prepared and we divided all employees in four levels. These are
    - **Management personnel**
    - **Office staff**
    - **Production staff**

- **General worker**

❖ **Data collection**
❖ **Data processing and analysis**

VI FINDINGS AND ANALYSIS

This section presents key findings of the study. Quantitative information has been presented through tables and figures. Statistical analysis has been performed using SPSS and MS Excel software. The findings from factories of RMG sector in Bangladesh has been analyzed here. Data wear collected through structured interview with industrial engineering officer, planning officer, production officer etc. For our thesis purpose, we exclude some factories to get the true reflection of productivity improvement. We collect data only from knitwear export oriented garments factories as the working procedure, machines, finished goods of these are almost similar. So it becomes easy to compare productivity of different factories. These factories employed different types of machines for the purpose of dyeing, knitting, sewing, cutting, ironing etc. Most of the factories are using manually operated and semi automated machines. We find that 60% of their machines are manually operated and 40% machines are semi automated. Very few factories engage fully automated machines for their dyeing, knitting, sewing, cutting purpose. We exclude these factories from the analysis to get the true reflection of productivity of similar organizations. The following sections present the findings and analysis systematically.

6.1 Demography of the Studied Organizations

We have visited thirty knitwear export oriented ready-made garments factories in Dhaka, Savar, Narayangonj and Gazipur. Yet all these factories are knitwear based but different types of products are produced in these factories such as basic style t-shirt, trouser, briefs, polo shirt, fleece jacket, tank tops, and kids wear etc. And productivity of these factories will be varied for the variation of finished product. For our thesis purpose we considered only basic t-shirt from knitwear group. When we collected data from knitwear garments factories, we converted all relevant data to as basic t-shirt whether it is trouser, briefs, polo shirt, fleece jacket, tank tops, kids wear etc. and more or less critical. This conversion process will be discussed later in this chapter. Here we discuss the demography of our studied factories in tabular format.

Table 1: Demography of studied factories (Part I)

No.	Types of product	Location	Total employee	Investment in a year (Taka)	Yearly Turnover (In million US$)
1	Knitwear	Dhaka	585	936000	1.4
2	Knitwear	Gazipur	613	1440000	2.5
3	Knitwear	Savar	1395	4375000	4.5
4	Knitwear	Gazipur	1117	3600000	5
5	Knitwear	Narayangonj	3000	3600000	10
6	Knitwear	Gazipur	3442	3000000	7
7	Knitwear	Gazipur	740	600000	3
8	Knitwear	Savar	578	450000	1.1
9	Knitwear	Savar	1619	2000000	12
10	Knitwear	Savar	3280	11700000	60
11	Knitwear	Savar	1550	4250000	11.8
12	Knitwear	Savar	2140	7200000	15
13	Knitwear	Dhaka	3000	9000000	20
14	Knitwear	Savar	2250	6600000	18
15	Knitwear	Narayangonj	2200	7556000	25
16	Knitwear	Dhaka	2460	7200000	6
17	Knitwear	Dhaka	2450	5400000	10
18	Knitwear	Dhaka	2980	12000000	70
19	Knitwear	Dhaka	1800	6000000	18
20	Knitwear	Dhaka	2475	4800000	12
21	Knitwear	Dhaka	1300	4500000	20
22	Knitwear	Dhaka	800	2160000	3
23	Knitwear	Dhaka	290	936000	4.5
24	Knitwear	Dhaka	265	936000	4
25	Knitwear	Dhaka	500	576000	3.5
26	Knitwear	Dhaka	876	2304000	4
27	Knitwear	Gazipur	1070	3240000	7
28	Knitwear	Savar	200	600000	1.2
29	Knitwear	Savar	1250	3456000	2.6
30	Knitwear	Savar	1425	5100000	10.2

Table 2**:** Demography of studied factories (Part II)

No.	No. Of Machines				Size of factory*
	Sewing	Knitting	Dying	Total	
1	175	16	14	205	Small
2	180	17	14	211	Small
3	400	30	11	441	Medium
4	360	10	6	376	Medium
5	920	30	22	972	Large
6	920	50	30	1000	Large
7	210	17	15	242	Small
8	175	10	6	191	Small
9	480	30	11	521	Large
10	1000	70	30	1100	Large
11	480	35	15	530	Large
12	620	30	18	668	Large
13	900	50	25	975	Large
14	650	35	15	700	Large
15	620	45	20	685	Large
16	750	50	15	815	Large
17	720	50	20	790	Large
18	800	60	25	885	Large
19	500	30	12	542	Large
20	750	45	20	815	Large
21	400	20	10	430	Medium
22	210	18	15	243	Small
23	100	10	5	115	Small
24	90	12	7	109	Small
25	120	10	7	137	Small
26	280	15	10	305	Medium
27	320	20	10	350	Medium
28	75	6	3	84	Small
29	400	22	15	437	Medium
30	415	20	10	445	Medium

*Size of factories is classified according to BKMEA standard. BKMEA classifies factories in three groups, small, medium and large in terms of number of machines. This classification is given below:

Table 3: Classification of factories

Size of factories	Range of the number of machines (for the purpose of dyeing, knitting and sewing)
Small	75-300
Medium	301-500
Large	More than 500

6.2 Status of the Training for Different Level of Employee

In this sub section we discuss the present status of training for different level of employee in RMG sector. In our visited factories, twenty two factories out of thirty have training facilities. Training facilities means the facilities are given to provide training in an organization. Some trainings are provided in-house and others are given outside of the factory. Some factories have training classroom, training centre, training schedule, different types of training equipments etc. for in-house training. Some organizations are also available for outside training. Bangladesh Knitwear Manufacturers and Exporters Association (BKMEA) is one of leading training institute for knitwear ready-made garments factories in Bangladesh. Bangladesh Garment Manufacturers and Exporters Association (BGMEA), Export Promotion Bureau (EPB) and other private organization also provide training to ready-made garments employee.

Table 4: Present status of training for different level of employee in our studied factories

Level of employee	Types of training	No. of Factories																													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Management Personnel	TQM										□								□						□						□	4
	Production planning															□																1
	Industrial Engineering concept										□					□			□						□							4
	Incentive criteria																		□													1
Office staff	Productivity Improvement Program(PIP)				□						□					□			□					□	□						□	7
	Compliance issues															□																1
	Shipment criteria																		□						□							2
Production staff	Productivity Improvement Program(PIP)			□							□		□		□	□			□	□		□		□		□			□		□	12
	Industrial Engineering Technique																		□													1
	TQM				□											□			□						□							4
General worker	Operator Training		□	□	□	□		□		□	□	□	□	□	□	□			□	□		□		□	□	□	□	□	□		□	22
	Health and Safety			□	□					□		□	□	□	□	□			□	□		□		□	□	□	□	□	□		□	18
	Skill Improvement										□				□	□			□						□							5
	Make operator Multiskilled				□						□				□	□			□					□	□						□	8

From the above table we found that twenty two factories provide training to their working personnel. In percent it become 73.30% and all of these provide training to general workers. But only 16.67% factories among thirty provide training to all level of employee. And it is necessary to say that only these 16.67% factories provide training to management personnel. Here 23.33%

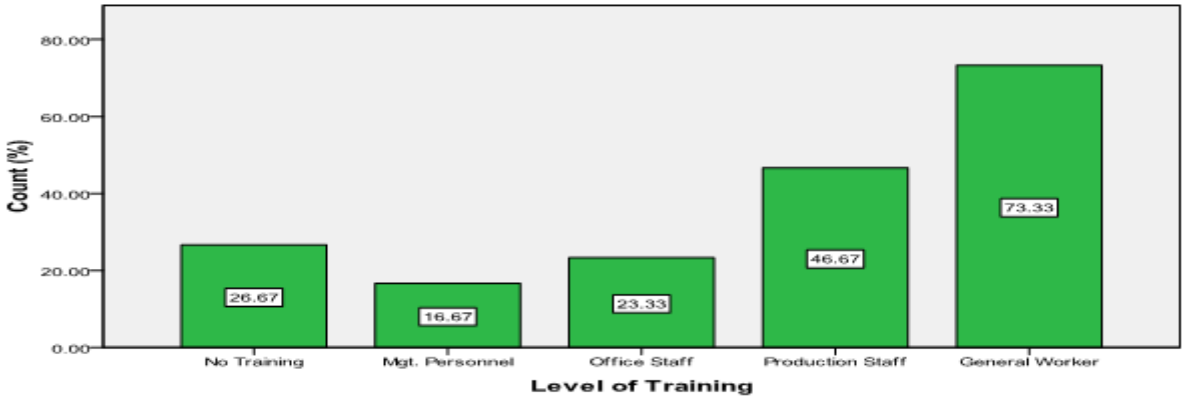

Figure 3: Training provided in different factories at different level

Factories have training facilities for office staff. Factories, those provide training to management personnel are also included with them. 46.67% factories have training facilities for production staff. There are also seven factories included training facilities for office staff available.

Here we also see that, some factories provide training to all level of employee and some don't provide training to any level. It is interesting to see that, the status of training also varies with the size of factories. In our studied factories we observe that, medium size of factories provide more training as compared to others. The status of training in different size of factories is

given below in tabular format:

Table 5: Status of training in different size of factories

Training to Different Level	Size of factories (in terms of no. of machines)			Total
	Small (75 to 300)	Medium (301 to 500)	Large (Above 500)	
Training to Mgt. Personnel and all	1(11.11%)	1(14.29%)	3(21.43%)	5(16.67%)
Training to office staff, production staff, and general worker	2(22.22%)	2(28.57%)	3(21.43%)	7(23.33%)
Training to office staff, production staff, and general worker only	1(11.11%)	1(14.29%)	0(0%)	2(6.67%)
Training to production staff and general worker	4(44.44%)	4(57.14%)	6(24.86%)	14(46.67%)
Training to production staff and general worker only	2(22.22%)	2(28.57%)	3(21.43%)	7(23.33%)
Training to general worker	6(66.67%)	6(85.71%)	10(71.43%)	22(73.33%)
Training to general worker only	2(22.22%)	2(28.57%)	4(28.57%)	8(26.67%)
Training to any level of employee	6(66.67%)	6(85.71%)	10(71.43%)	22(73.33%)
No Training	3(33.33%)	1(14.29%)	4(28.57%)	8(26.67%)

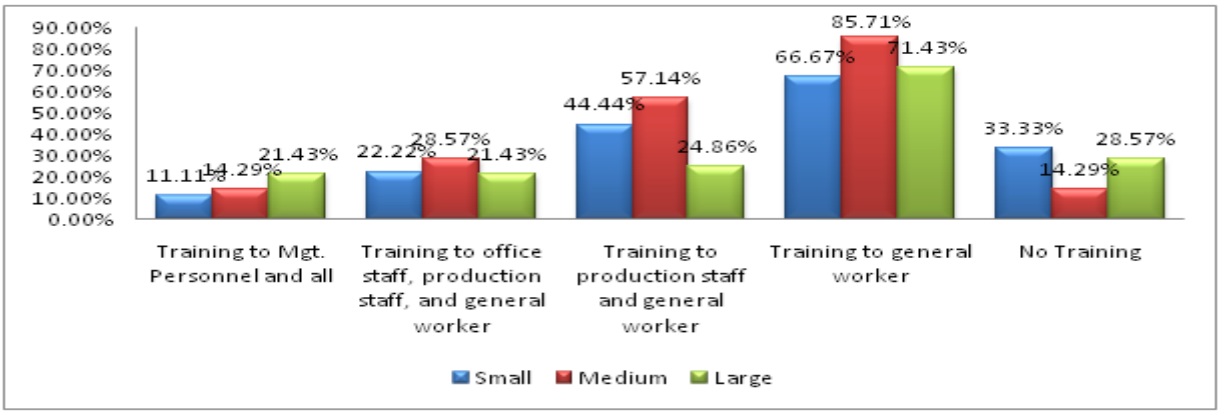

Figure 4: Comparison of different size of factories in terms of training

In the above figure, we see that in the management personnel and all level employees large size factories provide highest percentage of training and small size factories provide lowest percentage of training. Here next three levels where training is available for office staff, production staff and general workers level, for production staff and general worker level and only for general worker levels the medium size factories provide highest percentage of training. But we see that among in these three levels of employee, first two levels large size factories provide lowest percentage of training and third level where only general workers small size factories provide lowest percentage of training have. We can also see here that the percentage of training given to only general worker by different size of factories is comparatively higher than other level of employee. We also see that where no training is available the position of small size factories is above than other types of factories. In our questionnaire based case study we have observed that in small size factories have generally recruited skilled person for their factories and not interested for further training. Investment in training is significant in large factories, even though less number of large factories provide training as compared with medium factories. In generally large factories provide training informally to their employee.

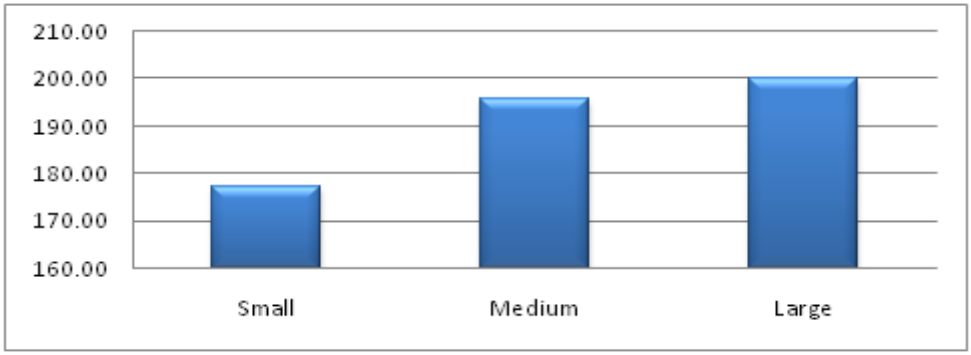

Figure 5: Mean investment in training per employee in different size of factories (Taka/year)

In figure 5, investment in training per employee in different size of factories (Taka/year) has shown. Here we see that small size factories investment lowest amount of money for an employee and large size factories investment highest amount of money.

6.3 The Criteria of Productivity Calculation

In this study we work with partial productivity that is labour productivity. Labour productivity is the ratio of total output and total number of employee.

$$labour\ productivity = \frac{total\ output}{total\ number\ of\ employee}$$

Yet all our visited factories are knitwear based but different types of products are produced in these factories such as basic style t-shirt, trouser, briefs, polo shirt, fleece jacket, tank tops, and kids wear etc. And productivity of these factories will be varied for the variation of finished product. For our thesis purpose we considered only basic t-shirt from knitwear group. When we collected data from knitwear garments factories, we converted all relevant data to as basic t-shirt whether it is trouser, briefs, polo shirt, fleece jacket, tank tops, kids wear etc. and more or less critical. This conversion is generated in the basis of standard minute value (SAM) of different product. The SAM of a same product is also different in different factories. We take average SAM of different product. SAM of different product is given below:

Table 6: Standard Allowed Minute (SAM) for Few Basic Garment Products

Product	SAM Range	SAM (average)	Output per Hour	Conversion factor
Crew neck T-shirt (Basic T-shirt)	6 to 12	8	7.5 X MP	1
Polo T-shirt	10 to 20	15	4 X MP	1.87
Formal full sleeve shirt	17 to 25	21	2.85 X MP	2.625
Formal trouser	25 to 45	35	1.71 X MP	4.375
Sweat Shirt (Hooded)	35 to 55	45	1.33 X MP	5.625
Jacket (Suit)	70 to 135	101	0.59 X MP	12.625
Women blouse	15 to 45	18	3.33 X MP	2.25
Bra	16 to 30	18	3.33 X MP	2.25
Brief	4 to 8	6	10 X MP	0.75

MP= Manpower (Operator + Assistant Operator)

To convert the output of any product in basic t-shirt we use a conversion factor. This factor is multiplied with that product which is needed to convert. For example, if the total output of a factory is 15000 pcs polo t-shirt per day and manpower is 300, then the productivity of that factory will be,

$$labour\ productivity = \frac{Daily\ Production\ \text{X Conversion Factor}}{Total\ Employee}$$

$$labour\ productivity = \frac{1500\ \text{X}\ 1.87}{300}$$

$$= 9.35 \text{ pcs basic t-shirt per head per day}$$

Labour productivity of our visited factories is given below in tabular format:

No:	Type of Product	Total Employee	Daily Production	Conversion Factor	Labour Productivity (pcs/day)
1	Basic T-shirt	585	3250	1	5.56
2	Polo T-shirt	613	2674	1.87	8.16
3	Polo T-shirt	1395	8124	1.87	10.89
4	Basic T-shirt	1117	12500	1	11.19
5	Formal trouser	3000	2857	4.375	4.17
6	Polo T-shirt	3442	5570	1.87	3.03
7	Sweat Shirt (Hooded)	740	370	5.625	2.82
8	Basic T-shirt	578	1563	1	2.70
9	Basic T-shirt	1619	6944	1	4.29
10	Basic T-shirt	3280	40625	1	12.39
11	Basic T-shirt	1550	14757	1	9.52
12	Formal trouser	2140	5714	4.375	11.68
13	Polo T-shirt	3000	16711	1.87	10.42
14	Polo T-shirt	2250	12255	1.87	10.19
15	Brief	2200	34981	0.75	11.93
16	Brief	2460	33333	0.75	10.16
17	Sweat Shirt (Hooded)	2450	3333	5.625	7.65

18	Basic T-shirt	2980	41667	1	13.98
19	Polo T-shirt	1800	11141	1.87	11.57
20	Sweat Shirt (Hooded)	2475	2963	5.625	6.73
21	Basic T-shirt	1300	15625	1	12.02
22	Formal trouser	800	1714	4.375	9.38
23	Basic T-shirt	290	3250	1	11.21
24	Basic T-shirt	265	3250	1	12.26
25	Polo T-shirt	500	1070	1.87	4.00
26	Polo T-shirt	876	4278	1.87	9.13
27	Basic T-shirt	1070	11250	1	10.51
28	Formal trouser	200	476	4.375	10.42
29	Polo T-shirt	1250	6417	1.87	9.60
30	Basic T-shirt	1425	17708	1	12.43

6.4 Labour Productivity Vs Training

We mention before that training is one of the most important factors to improve productivity in both manufacturing and service industries. We have visited thirty ready-made garment factories and collected training and productivity relevant data. This information also shows that, there is a strong relationship between training and productivity. In Figure 7 the mean labour productivity is less in the organizations those do not provide any type of training as compared with the organizations which provide training at the all level (management personnel, office staff, production staff, and general worker level). And their productivity is more as compared with other organizations which provide training only three or two levels (production staff and general worker level) or provide training only for the general workers. So we can say that to make our organizations more productive it is essential to train up all level of employee. Here we divide our visited factory in nine groups in the basis of training that those factories are provided. This comparison is provided in tabular and graphical format below:

Table 7: Labour productivity of different factories for different level of training

Training to Different Level	No. Of Factories	Mean labour productivity (pcs/day)
Training to Mgt. Personnel and all	5(16.67%)	12.60
Training to office staff, production staff, and general worker	7(23.33%)	12.20
Training to office staff, production staff, and general worker only	2(6.67%)	11.20
Training to production staff and general worker	14(46.67%)	11.15
Training to production staff and general worker only	7(23.33%)	10.11
Training to general worker	22(73.33%)	9.78
Training to general worker only	8(26.67%)	7.38
Training to any level of employee	22(73.33%)	9.78
No Training	8(26.67%)	6.85

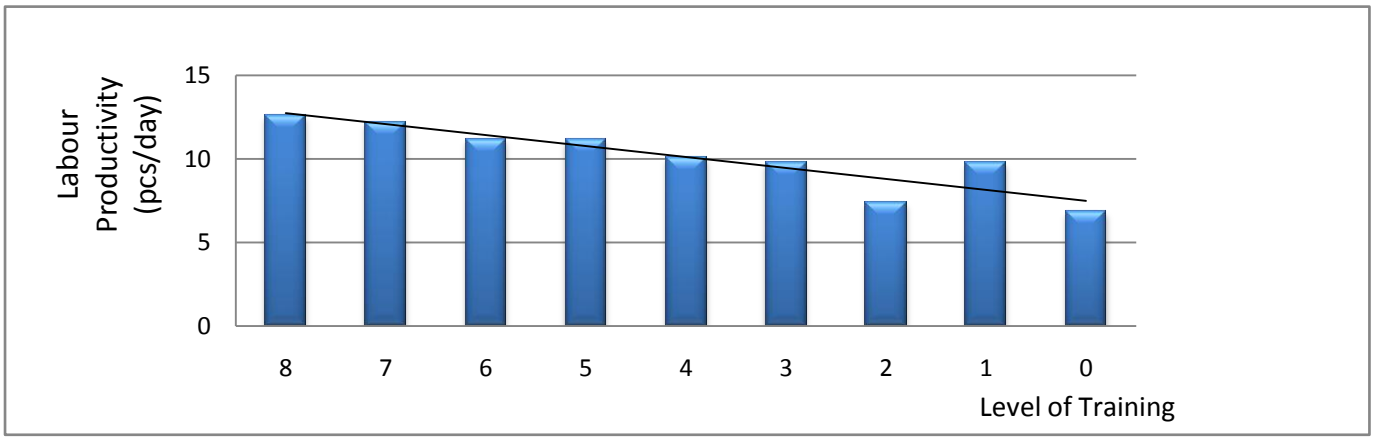

Figure 6: Relationship between different level of training and productivity

Here,

8= Training to Mgt. Personnel and all

7= Training to office staff, production staff, and general worker

6= Training to office staff, production staff, and general worker only

5= Training to production staff and general worker

4= Training to production staff and general worker only

3= Training to general worker

2= Training to general worker only

1= Training to any level of employee

0= No Training

Managerial training model focuses on technology, social science and business. On the other hand training for office staff is provided to enrich the knowledge of tactical planning, skill of fastest and efficient information flow. The production staff required training for efficient use of technology and their maintenance, leading and motivate the worker. Training provides them to develop the knowledge of operational planning. General workers need training for developing working skill, motivation, ability to enrich their own job.

For these reasons productivity of those organizations which provide training to all level of employee are more than other organizations. And productivity is less in those organizations which don't provide any training. Though some organizations claim that their management personnel are experienced enough and they don't need further training, but the reality is that the productivity of that organization is less as compared with other organizations those provide training to all level of employee. So we can say that, training is needed for all level of employee as long as they perform their job.

6.4.1 Training Investment Vs Productivity

From the previous section we realise that training at all level of employee is important to improve productivity. In this section we are willing to analyse how much intensive is needed for training to improve productivity. It is depicted in figure 8 that the increasing in the investment in training also increases labour productivity. The trend of productivity and investment in training which is depicted in figure 9 is increasing, that represent that when we increase our investment in training, it will increase total productivity.

At figure 8 we can also see some short bars which represent that productivity of some factories are low, though they provide training. There may be some reasons behind this contradictory result. These are,

- The training that they are provided not appropriate, or
- Not proper training technique is used, or
- Any hidden factors which are not consider in this study like corruption, misconception between top management and worker, fault in any other driver of supply chain (e.g. raw material collection, shipment, marketing policy etc.).

Figure 7: Labour productivity vs. Investment in training

6.5 Correlation Test

Here we want to look at the relationship between two variables, investment in training (Tk/year) and labour productivity (pcs/day). We have a hypothesis that increase in labour productivity will increase labour productivity. And, here are the descriptive statistics:

Table 8: Descriptive statistics of investment in training vs. labour productivity

Variable	Mean	Std. Deviation	N
Labour productivity (pcs/day)	8.9990	3.30584	30
Investment in training (Tk/year)	192.21	169.565	30

Now, we'll look at the simple bivariate (i.e., two-variable) plot

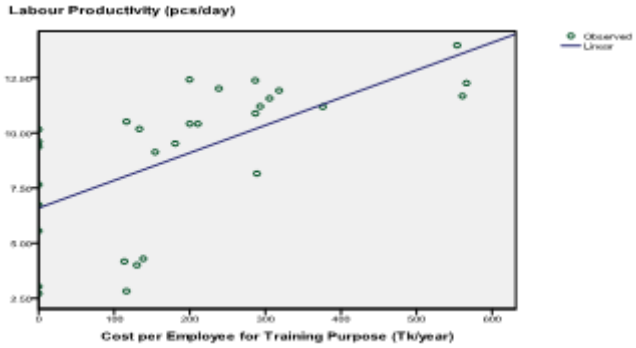

Figure 8: Bivariate (i.e., two-variable) plot with a positive slope

We see in the bivariate plot that the relationship between the variables is a positive one because a single straight line through the dots it would have a positive slope or move up from left to right. Since the correlation is nothing more than a quantitative estimate of the relationship, we would expect a positive correlation. Positive relationship means that, in general, higher scores on one variable tend to be paired with higher scores on the other and that lower scores on one variable tend to be paired with lower scores on the other. We confirm visually that this is generally true in the plot above.

Table 9: Correlations between investment in training and labour productivity

Variable	Investment in training	
Labour productivity	Pearson Correlation, r	0.642**
	Sig. (2-tailed)	0.000
	N	30

** Correlation is significant at the 0.01 level (2-tailed).

So, the correlation for our thirty cases is 0.642, which is a fairly strong positive relationship. Once we have computed a correlation, we can determine the probability that the observed correlation occurred by chance. That is conducted by a significance test. Most often we are interested in determining the probability that the correlation is a real one and not a chance occurrence. In this case, we are testing the mutually exclusive hypotheses:

Null Hypothesis: $r = 0$

Alternative Hypothesis: $r <> 0$

To test this hypothesis we need to first determine the significance level. Here, we'll use the significance level of alpha = 0.01. This means that we are conducting a test where the odd that the correlation is a chance occurrence is no more than 1 out of 100. Before we look up the critical value in a table (Critical values for Pearson r; Appendix: A) we also have to compute the degrees of freedom or df. The df is simply equal to N-2 or, 30-2 = 28. Finally, we have to decide whether we are doing a one-tailed or two-tailed test. Here we select the two-tailed test. With these three pieces of information -- the significance level (alpha = .01)), degrees of freedom (df = 28), and type of test (two-tailed) -- we can now test the significance of the correlation we found. When we look up this value in the table (Critical values for Pearson r; Appendix: A) we find that the critical value is 0.463. This means that if our correlation is greater than 0.463 or less than -0.463, we can conclude that the odds are less than 1 out of 100 that this is a chance occurrence. Since our correlation of 0.642 is actually quite a bit higher, we conclude that it is not a chance finding and that the correlation is "statistically significant". I can reject the null hypothesis and accept the alternative.

6.6 Result

There is a strong positive relationship and significant effect of training with productivity. The correlation is 0.642, which is statistically significant at the 0.01 level (2-tailed). So, we can say that if a firm provides more training then the productivity of that firm will be more.

VII CONCLUSION

Though skills development is regarded as a key driver for productivity performance, it is difficult to measure the effect of job training on productivity at the individual level, but there is no doubt that it is very important for constructing and evaluating a job training strategy from the viewpoint of human resource development. Skills development, through training activities, should be targeted and focused in order to yield any potential productivity gains. At the same time, it has to be recognised that other factors, such as work organisation and levels of capital investment, may need to be addressed in concert when considering productivity performance, and as such skills development should only be regarded as an enabler or a catalyst for bringing about productivity improvements. There is a need to consider that pursuing skills development does not necessarily mean that such skills are directly transferred or deployed in the workplace in such a way that would bring about the proclaimed productivity improvements. Issues such as employee motivation and the context of the organisation in which they are working are vital factors if the efforts of skills developments are to be further progressed and have a positive impact on a business. This warrants further research in order to unpack this complexity of the transfer and utilisation of skills development in the workplace. Yet the argument is that if the business need of skills development is visible to employers

then they would take ownership of the training activities required and will allocate the required resources for it, and arguably will not wait for coercion to train. As such, the benefits of training in relation to productivity performance need to be viewed in the context of a business activities, plan and strategy - given the diverse and disparate needs of RMG sector.

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